

MAGNETIC GRAPHICS DISPLAY

FIELD OF THE INVENTION

The invention relates to a graphics display using a magnetic attraction to support a graphics sheet.

BACKGROUND

It is known to magnetically support graphics or characters on a base member to permit easy changing of the graphics or characters. For example, U.S. Patent No. 4,242,823 to Bruno discloses a display device 10 including a screen mesh layer or sheet 12 that is adapted to be magnetically attractive, and frame means 14 that retains the sheet 12 in a generally flat configuration. The edges of the sheet 12 are retained in a continuous recess 26 the frame means 14. A cover sheet 16 can be permanently or removably (e.g., by tacks 34) attached to the frame means adjacent to the sheet 12. Magnetic indicia characters 38 may be removably attached to the cover sheet 16.

U.S. Patent No. 4,366,637 to Dechamps discloses a steel sheet 5 coated with thin layers of paint 6, 7, a protective coat 8, and a silk screened layer 9. The layers of paint, the protective coat, and the silk screened layer are thin enough to create a magnetically-permeable base. Characters 2 made of rubber and carrying magnetic charges formed by barium ferrite may then be magnetically attached to the sheet 5.

U.S. Patent Nos. 5,163,241 to Blaeser et al., 4,009,524 to Valentine, and 4,942,275 to Addy et al., disclose other graphical displays in which graphics are silk screened onto a piece that is magnetically supported on a panel.

The above-described references teach various types of magnetic devices that include a graphical display. The arrangement of magnetic material on the devices is conventional.

SUMMARY

It would be advantageous to provide a graphic display apparatus including a magnetic receptive surface applied by a quick and low-cost process. One process that can be used for applying a magnetic receptive surface to a piece of the graphic display is silk screening. Silk screening has previously been used for applying a graphical depiction to a piece of the graphic display, but has not heretofore been used to apply the magnetic receptive material thereto.

The present invention provides a display system comprising a graphics sheet having a front surface and a rear surface. The front surface of the graphics sheet includes a graphic image. A magnetic receptive material is silk screened onto the rear surface of the graphics sheet. The display system also includes a base including a magnetic mounting surface to which the graphics sheet is releasably attached through the magnetic attraction between the magnetic receptive material and the magnetic mounting surface. The base may include a plurality of cut-outs to provide a structurally stable base that requires less material than a solid base would require.

Preferably, the magnetic receptive material includes a graphite powder mixed in a clear carrier material. The magnetic mounting surface may include a plurality of magnetic strips attached to the base, and the magnetic strips may be include barium ferrite. As an alternative to applying the magnetic receptive material directly to the rear surface of the graphics sheet, adhesive strips may be

affixed to the rear surface of the graphics sheet and the magnetic receptive material may be silk screened onto the adhesive strips.

Other features and advantages of the invention will become apparent to those skilled in the art upon review of the following detailed description, claims, and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective illustration of a magnetic graphics display system embodying the present invention.

Fig. 2 is an exploded view of the system.

Fig. 3 is a cross-section view taken along line 3-3 in Fig. 1.

Fig. 4 is an exploded view of an alternative embodiment of the invention.

Before one embodiment of the invention is explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including" and "comprising" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. The use of "consisting of" and variations thereof herein is meant to encompass only the items listed thereafter. The use of letters to identify elements of a method or process is simply for identification and is not meant to indicate that the elements should be performed in a particular order.

DETAILED DESCRIPTION

Fig. 1 illustrates a display system 10 including a base or frame 14 and a graphics sheet 18 supported by the base 14. The base 14 may be mounted to a wall, a stand, or another suitable structure for displaying the graphics sheet 18. The graphics sheet 18 includes a front surface seen in Fig. 1 and having a graphical image 22 applied thereto, and an opposite, rear or back surface. The illustrated graphics sheet 18 may be removed and replaced with a structurally identical graphics sheet 18 having a different graphical image 22. Thus, one may select a particular graphics sheet 18, having a desired graphical image 22, from a plurality of graphics sheets 18 for a particular occasion.

As seen in Fig. 2, the rear surface of the graphics sheet 18 has applied thereto a magnetic receptive material in three strips 26. Of course, fewer strips 26 or more strips 26 may be provided as is necessary, the magnetic receptive material may be arranged in a pattern other than shown (e.g., discrete squares of magnetic receptive material), or the entire rear surface may be covered with the magnetic receptive material. In this regard, the term "strip," as used herein for the magnetic receptive material and as further used below for other elements, means a finite extent of material in any shape. It is preferable to use as few strips 26 as possible to reduce the cost and complexity of construction of the display system 10.

The strips 26 of magnetic receptive material are applied to the rear surface of the graphics sheet 18 by a silk screening process. The magnetic receptive material is preferably a metallic, magnetic compound. Preferably, the magnetic receptive material includes a graphite powder mixed with a clear carrier. The

clear carrier is preferably a water-based slurry. The resulting magnetic receptive material is preferably provided in ink form to facilitate the silk screening process.

The illustrated base 14 is constructed of a plastic material, and includes a plurality of cut-outs 30 to reduce the weight of the base 14 and to reduce the cost of materials for constructing the base 14. The cut-outs 30 create a grid of slats 32 that provide a lightweight yet structurally stiff base 14. Magnetic strips 34 are attached to the base 14 with an adhesive, fasteners, or another suitable means for attaching. The magnetic strips 34 are arranged to register with the strips 26 of magnetic receptive material on the graphics sheet 18. The magnetic strips 34 are preferably made of barium ferrite, but may be constructed of another suitable magnetic material. The illustrated magnetic strips 34 are positioned at the top, middle, and bottom of the base 14, in alignment with the magnetic receptive material on the graphics sheet 18, but could be arranged in different patterns to mirror the arrangement of the magnetic receptive material on the graphics sheet 18.

Fig. 3 illustrates an enlarged cross-section of the display system 10, which illustrates the graphics sheet 18 mounted on the base 14. The magnetic attraction between the magnetic strips 34 and the strips 26 of magnetic receptive material is sufficient to support the weight of the graphics sheet 18.

Fig. 4 illustrates an alternative embodiment in which a plurality of adhesive strips 38 are mounted to the rear surface of the graphics sheet 18, and the magnetic receptive material is silk screened onto the adhesive strips 38. Of course, fewer strips or more strips may be provided as is necessary, the adhesive strips 38 may be arranged in a pattern other than shown (e.g., discrete squares of adhesive material silk screened with magnetic receptive material), or the entire

rear surface may be covered with a large adhesive strip silk screened with the magnetic receptive material. Identical elements are identified with the same reference numerals as used in Figs. 1-3.

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